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NEW SPECIES OF *BEGONIA* (BEGONIACEAE) FROM MEXICO AND CENTRAL AMERICA

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ABSTRACT

Begonia boqueronensis Burt-Utley & Utley and **B. calzadae** Burt-Utley & Utley from Chiapas, México, and **B. skutchii** Burt-Utley & Utley from Costa Rica are described as new, illustrated, and compared to relevant species recognized in the forthcoming volume of Flora Mesoamericana.

During preparation of the Begoniaceae for Flora Mesoamericana, several new species were previously described (Burt-Utley & Utley 2011, 2012), resulting in the recognition of 102 species in the preliminary manuscript of the Begoniaceae for the Flora. Two of the new species described herein, *B. boqueronensis* and *B. calzadae*, are placed in sect. *Gireoudia* (Kl.) A. DC. because of their apetalous flowers and trilocular ovaries, while the third has the fleshy bilocular ovaries characteristic of sect. *Weilbachia* (Kl. & Oerst.)A. DC. With these species, there are now 105 *Begonia* species know to occur within the boundaries of the Flora.

1. **BEGONIA BOQUERONENSIS** Burt-Utley & Utley, **sp. nov. TYPE. MÉXICO. Chiapas.** 1.5 km SW of Ojo de Agua along road from El Rosario to Niquivil, 1675 m, 6 Nov 1986, *D.E. Breedlove 65663* (holotype, CAS). Figure 1.

Begonia boqueronensis shares a number of characters with another species in the sect. *Gireoudia*, *B. strigillosa* A. Dietr., but is readily distinguished from this latter taxon by its rhizomes with often elongate internodes [(0.4–)2–3 cm vs. 0.3–0.8(–1.4 cm)] and its deciduous, narrowly ovate-triangular stipules vs. the persistent broadly ovate to triangular stipules of *B. strigillosa* [8–17 x 4–8 mm vs. 10–19(–22) x 5–9 mm]. The lowermost obovate inflorescence bracts of *B. boqueronensis* are significantly smaller than the ovate to elliptic bracts of *B. strigillosa* (4.5 x 2 mm vs. 11–21 x 7–9 mm). Moreover, capsules of *B. boqueronensis* are smaller than those of *B. strigillosa* [0.8–0.9 cm vs 0.9–1.4(–2) cm].

Rhizomatous herbs to 21.5+ cm long; internodes short to elongate, (0.4–)2–4.5 cm, 1.5–3(–5) mm diam, squamose with broad laciniate scales to 4 mm throughout, cystospheres present. **Leaf blades** oblique, asymmetrically elliptic to ovate or obovate, (2.9–)4.8–14.8 x (1.9–)3.3–9.2 cm, basally cordate, apically acuminate, marginally ciliate and dentate to denticulate, crenulate or serrulate, sometimes with a shallow dentate lobe opposite the petiole insertion, above glabrous except for villi occasionally above the petiole-blade insertion, sparingly villous to squamose below on major nerves, intercostal regions glabrous, green above, often with maroon maculations, green or maroon throughout beneath; 9–11-palmatinerved; petioles (3–)6–12.7 cm, densely squamose with broad to narrow lacerate scales 2–5 mm and occasionally villi intermixed, cystospheres present; stipules deciduous, reflexed with age, narrowly ovate-triangular, 8–17 x 4–8 mm, marginally entire, revolute, glabrous to villous or the conspicuous keel only villous to squamose, cystospheres present. **Inflorescences** asymmetrically cymose, apparently greatly exceeding the foliage; peduncles 10–39 cm, sparingly villous and squamose; bracts caducous, the lowermost appearing obovate, 4.5 x 2 mm, marginally entire, glabrous. **Staminate flowers** with pedicels 1–2.7 cm, glabrous; sepals 2, elliptic to broadly ovate or suborbicular, 8–13.5 x 7–12 mm, glabrous, white to dark pink; petals wanting;

Figure 1. *Begonia boqueronensis*, holotype (*Breedlove 65663*, CAS).

stamens (6–)8–14, on a slightly raised torus or appearing free; filaments 1–1.5 mm, anthers oblong to obovate in outline, 1.3–1.7 x 0.7–0.9 mm. **Pistillate flowers** with pedicels 5–7 mm, glabrous; bracteoles wanting; sepals obovate to transversely elliptic, 6–8.5 x 6–9.5 mm, glabrous, white to dark pink, very sparingly glandular; petals wanting; ovaries trilocular with bipartite placentae, ovuliferous throughout, 4.5–8.5 mm, glabrous to very sparingly glandular, pink and sometimes maculate; styles 3, 2–3.5 mm, connate to ½ their length; stigmas lunate. **Capsules** with pedicels 7–14 mm; bodies 8–9 mm, locule chambers externally appearing ovate to ovate-elliptic, 6.5–9 x 4.5-6.5 mm; wings 3, unequal, the largest oblique, asymmetrically triangular to asymmetrically ovate, 6–10 x 8–9 mm, rounded to acute, occasionally denticulate distally, the second asymmetrically triangular, 4–6.5 x 5–8 mm, the third equal to subequal to the second or shallowly asymmetrically triangular to lunate.

Etymology. *Begonia boqueronensis* is named after Cerro Boquerón, where Purpus first collected this species.

Distribution and habitat. Slopes and ravines with *Pinus*, *Quercus*, and *Ostrya* between 1675 and 2255 m in southeastern Chiapas and Guatemala.

Begonia boqueronensis is distinguished from the apparent Chiapan endemic, *B. cristobalensis* Ziesenh., by a number of characters, including its often elongate, squamose internodes, in contrast to the short internodes of *B. cristobalensis* with its pubescence restricted to a ring scales at the bases of the petioles and its longer stipules [8–17 mm vs. 4–8(–10) mm]. When the number of nerves on leaf blades are compared, blades of *B. boqueronensis* are 9–11-nerved, while those of *B. cristobalensis* are 6–9-nerved. Comparing petiolar induments of these two species, the indument of *B. boqueronensis* consists of narrow to broad lacerate scales 2–5 mm long with occasional villi intermixed. In contrast, the indument of *B. cristobalensis* is villous throughout or villous with narrow scales 2–6 mm intermixed.

Specimens examined. MÉXICO. Chiapas. Ridge NE of Cerro Boquerón on rd from El Rosario to Niquivil, 2255 m, 29 Nov 1985, *Breedlove and Sigg 66051* (CAS); Cerro del Boquerón, Sep 1913, *Purpus 6932* (UC). **GUATEMALA. Quetzaltenango.** Region of las Nubes, S of San Martín Chile Verde, ca. 2250 m, 27 Jan 1941, *Standley 85183* (F).

2. BEGONIA CALZADAE Burt-Utley and Utley, **sp. nov. TYPE. MÉXICO. Chiapas.** Entre Finca Prusia y Triunfo, Sierra Madre, 1000–1300 m, 12 Jan 1971, *E. Matuda 38243* (holotype, MO; isotypes, CAS-2). Figure 2.

Begonia calzadae stands apart from other species in sect. *Gireoudia* in its often elongate lowermost inflorescence branches; also unusual are its lowermost staminate pedicels that can reach 9.5 cm in the Matuda collections (however, pedicel length in an inflorescence of *B. calzadae* decreases from the lowermost branches to the upper branches). *Begonia calzadae* can be distinguished from most other species of *Begonia* in Chiapas with squamose petioles by its short rhizome internodes.

Rhizomatous herbs; nodes with a ring of short but broad lacerate scales surrounding the bases of the petioles and stipules; internodes apparently short, 3.5–7 mm x 0.4–1.2 cm, glabrous, cystospheres present. **Leaf blades** oblique to rarely substraight, asymmetrically ovate to elliptic, 11.8–23.5 x 8–15.3 cm, apically abruptly short acuminate, basally cordate, marginally ciliate and shallowly dentate to denticulate at ends of major nerves; above with stout villi to 5 mm only above and near the petiole insertion, otherwise glabrous to minutely glandular, below squamose stoutly villous and glabrous to minutely glandular on major nerves, intercostal regions glabrous to minutely glandular with occasional villi occasionally present, abundant cystospheres at the base of nerves, leaves green throughout or with maroon maculations; 10–12-palmatinerved; petioles 12–33 cm, squamose, the broad lacerate scales 2–6 mm, spreading to reflexed, and a dense band of lacerate

Figure 2. *Begonia calzadae*, holotype (*Matuda et al. 38243*, MO).

scales 3–7 mm just below the petiole-blade junction, cystospheres abundant; stipules asymmetrically triangular, 1.2–2.3 cm x 7–8 mm, marginally somewhat revolute, entire, strongly keeled with the keel only sparingly villous to squamose, cystospheres present. **Inflorescences** dichotomously branched, but rarely trichotomous at the lowermost node, moderately asymmetric, often very many-flowered; peduncles 25–35 cm, glabrous to sparingly squamose; lowermost bracts wanting, the mid to upper bracts 9 x 6–7 mm, apically rounded to asymmetrically bilobed, marginally entire, sometimes weakly undulate, glabrous, often finely keeled especially distally. **Staminate flowers** with pedicels 1.1–5.5(–9.5) cm, glabrous to occasionally narrowly squamose; sepals 2, elliptic to suborbicular or obovate, (0.7–)1–1.6 x (0.5–)0.8–1.1 cm, glabrous to glandular, maroon maculate; petals wanting; stamens 8–12, appearing free or at least some on a very shallow torus; filaments 0.5–1.5 mm; anthers narrowly obovate, 1.5–2 x 0.7–1 mm. **Pistillate flowers** with pedicels 1.4–1.6 cm, occasionally villous distally; bracteoles wanting; sepals 2, suborbicular to broadly elliptic or transversely elliptic, 7–8.5 X 6.5–8 mm; petals wanting; ovaries trilocular with bipartite placentae, 7–9.5 mm, glandular and maculate; styles 3, 2 mm, fused half their length; stigmas lunate. **Capsules** with pedicels 1.1–1.7 cm; bodies 7-11 mm; locule chambers externally appearing ovate, 6–8 x 5–6.5 mm; wing 3, unequal, the largest asymmetrically triangular, 5–9.5 x 6–8 mm, apically rounded, acute or acuminate, the second asymmetrically triangular to lunate-triangular, 4–7 x 6.5–8 mm, apically acute to acuminate, the third asymmetrically lunate to lunate-triangular, 3–4.5 x 5.5–8 mm, apically rounded to subacute.

Etymology. *Begonia calzadae* is named in honor of J.I. Calzada, who collected this species from the same general area as Matuda's type.

Distribution and habitat. *Begonia calzadae* is known only from the region between El Triunfo and Finca Prusia in the Sierra Madre de Chiapas where it potentially ranges from 1200 m to 1600 m. Calzada's description of the location is this: "Bosque caducifolio ecotonía con Pinar, zona de cañadas, el suelo café orcilloso profundo."

Begonia calzadae is immediately distinguished from *B. boqueronensis* with its short internodes and from *B. cristobalensis* by its larger leaves (11.8–23.5 x 8–15.3 cm vs. 4.3-10 X 2.5-7 cm) and longer peduncles [(25–35 cm vs. 5.3–15.3(–16.3)] cm. *Begonia calzadae* also has a petiolar indument of broad lacerate scales 2–6 mm and an annulus of similar broad lacerate scales just beneath the blade insertion. In contrast, the petioles of *B. cristobalensis* are both villous or villous and squamose with villi and scattered narrow laciniate scales but no annulus. Leaf blades of *B. calzadae* also have more numerous nerves (10–12) than those of *B. cristobalensis* (6–9). When *B. calzadae* is compared with *B. hispidavillosa* Ziesenh., there is an obvious difference in stipule form and size, with those of *B. calzadae* appearing asymmetrically triangular and 1.2–2.3 cm x 7–8 mm vs. stipules of *B. hispidavillosa* that are asymmetrically very broadly ovate-triangular or hemiorbicular and 0.5–1.2 x 0.8–1.7 cm. Moreover, pedicels of both staminate and pistillate flowers of *B. calzadae* are typically much longer than those of *B. hispidavillosa* [♂ 1.1–5.5(–9.5) cm vs. 0.5–0.8(–1.2) cm; ♀ 1.4–1.6 cm vs. (2.5–)4.5–8 mm].

Specimens examined. MÉXICO. Chiapas. Mpio. Jaltenango de La Paz, senda de Campamento El Triunfo para Finca Prusia, 1600 m, 5 May 1988, *Calzada 14123* (MEXU, USF, XAL).

3. BEGONIA SKUTCHII Burt-Utley and Utley, **sp. nov. TYPE. COSTA RICA. San José.** 14.1 km W of square in San Isidro de El General in Fila Tinamastes along road to Dominical, ca 900 m, 27 Jun 1995, *K. Utley & J. Utley 9032* (holotype: USF; isotypes: CR, MO, US). Figure 3.

Begonia skutchii overlaps both *B. carletonii* Standl. and *B. turrialbae* Burt-Utley & Utley in a number of characters including internode lengths, leaf blade size and numbers of nerves. All three species

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COSTA RICA. San José. 14.1 km W of square in San Isidro de El General in Fila Tinamastes along the road to Dominical, ca 900 m.
Epilithic and terrestrial in seepage areas in remnant cloud forests.
Utley & Utley 9032
27 June 1995
UNIVERSITY OF SOUTH FLORID HERBARIUM

Figure 3. *Begonia skutchii*, holotype (*Utley & Utley* 9032, USF).

also have a petiolar indument with short villi. Stipules of *B. skutchii* are triangular to ovate, in contrast to those of *B. carletonii* that are often lance-triangular and more narrow (2–5 mm vs. 2–3 mm), while those of *B. turrialbae* are lance-ovate to lanceolate and similar in width to those of *B. skutchii*. Staminate sepals of *B. skutchii* are typically smaller than those of *B. turrialbae* [3–8(–11) x 2–4.5 mm vs. 6–17 x 4–12 mm] and generally more narrow than those of *B. carletonii* (2–4.5 mm vs. 3.5–6mm).

Rhizomatous herbs, the rhizomes elongate and branching; internodes short to elongate, slender, 0.5–4.5 cm x 1.2–3 mm, moderately to densely villous with trichomes 0.4–2 mm. **Leaf blades** substraight to oblique, asymmetric, ovate to oblong, 3.8–13.7 x 3.5–9 cm, basally cordate, apically attenuate-acuminate, marginally occasionally finely dentate or serrate, ciliate and glandular-ciliate-denticulate or serrulate, often with a broad rounded to acute lobe opposite the petiole insertion, above coarsely papillose and pustulate with villi 0.5–2 mm terminating some of the acuminate pustules, below finely alveolate and densely villous throughout with trichomes to 1 mm; (8–)9–11-palmatinerved; petioles 3.6–10.5(–15.5) cm, moderately to densely villous with trichomes 0.5–2 mm; stipules persistent to deciduous, triangular to ovate, (3–)5–9.5(–11) x (1.5–)2–5) mm, sparingly to densely villous. **Inflorescences** generally strongly asymmetrically cymose, when immature the branches and immature flowers strongly reflexed, few-many-flowered; peduncles (3.6–)6.2–15.3 cm, glandular and sparingly villous; bracts persistent to deciduous, oblong to oblong-ovate, 3–9 x 1–3 mm, glabrous to puberulous, pink. **Staminate flowers** with pedicels 5–19 mm, glandular and very sparingly short villous; sepals 2, elliptic to obovate, 3–8 (–11) x 2–4.5 mm, sparingly glandular and puberulous, internally white to pink, externally deep pink; petals 2, oblanceolate to narrowly elliptic, 2.5–6 x 1–2 mm, glabrous, white; stamens 13–25(–33), free or inserted on a low torus; filaments 0.4–0.7 mm; anthers oblong to obovate, 0.7–1.3 x 0.3–0.6 mm. **Pistillate flowers** with pedicels 4.5–9 mm, glandular and very sparingly short villous; bracteoles wanting; sepals 2, elliptic to broadly transversely elliptic or suborbicular, 4.5–9 x 4.5–11 mm, entire, externally sparingly glandular and puberulous, internally white, externally white to rose pink; petals 1, oblanceolate, 4 x 1 mm; ovaries bilocular with bipartite placentae, 6.5–8 mm, sparingly glandular and puberulous, the wings marginally sparingly ciliate, green deeply suffused red; styles 3 with one often reduced in size, to 2.5 mm, fused only briefly basally; stigmas 3, 2 dilated-lunate and one sometimes reduced and lunate. **Capsules** with pedicels 10–16 mm; bodies beaked, very strongly nutant, 9.5–11 mm, very sparingly pilose, green suffused red; locule chambers externally asymmetrically elliptic, 6–6.5 mm; wings 3, unequal, the largest oblong to ovate, 9–17 x 6–11 mm, apically rounded to truncate, marginally sparingly finely ciliate, the second asymmetrically triangular to lunate, 3.5–5.5 x 7–8.5 mm, the third subequal to the second.

Etymology. This species is named in honor of the late Dr. Alexander Skutch (1904–2004) who first collected this species in 1940. During his long and prolific career, Skutch wrote extensively on Costa Rica and the birds of Costa Rica.

Distribution and habitat. *Begonia skutchii* can be found growing epilithically, epiphytically and terrestrially in primary forests and in seepage areas in remnant cloud forests between 180–900 m in southwestern Costa Rica. *Begonia skutchii* is one of five species in sect. *Weilbachia* known to occur in Costa Rica. Like other species in this Mexican and Central American section, its ovaries are bilocular with bipartite placentae and its capsules are nutant. Moreover, capsular dehiscence only occurs after a portion of the fleshy covering of the capsular body erodes. Although two or three styles may be present among the species, the third, when present, not infrequently is smaller and less developed with a smaller stigmatic surface (Burt-Utley & Utley 1999). Species in the section have both staminate flowers and pistillate with an inner perianth series like *B. skutchii*, while others simply have apetalous flowers in both sexes. This latter condition can be observed in *B. copeyana* C. DC. and *B. vestita* C. DC. from Costa Rica, as well as in other species in the section from Central America and México. An unusual character that can be observed in *B. skutchii* and only occurs in sect.

Weilbachia in Mexico and Central America is its finely pustulate upper leaf surfaces with some of the pustules terminating in stout villi. Depending upon specimen preparation, the lower leaf surface of *B. skutchii* will appear finely alveolate. *Begonia skutchii* shares with *B. turrialbae* Burt-Utley & Utley its unusual pustulate upper leaf surfaces. In contrast, *B. carletonii* has upper leaf surfaces that are finely beaded, appearing at most very shallowly papillose. When inflorescences of *B. skutchii* are compared with these latter species, those of *B. skutchii* are strongly asymmetric and several to many-flowered, while those of *B. turrialbae* are unilateral, typically producing a flower and a branch at each node and ending with a single terminal flower. In contrast, inflorescences of *B. carletonii* are symmetric and few-flowered.

Specimens examined. COSTA RICA. San José. Basin of El General, 675–900 m, Mar 1940, *Skutch 4864* (CR, US); 9.9 km SW of Río Pacuare and 3.1 km N of Tinamastes in Fila Tinamastes along rd from Dominical to San Isidro, ca. 3200 ft, 30 Jul 1983, *Utley & Utley 7238* (BM, C, CAS, CR, DUKE, F, GH, MO, NY, US, USF); 14.5 km W of square in San Isidro de El General along road to Dominical, 900 m, 21 Feb 1987, *Utley & Utley 8237* (CAS, DUKE, MEXU, MO). **Puntarenas.** Cantón de Golfito, Dos Brazos de Río Tigre, Jiménez, Cerro Müller, bajando por la fila a las afluentes de Río Niño, 8° 30' 35" N, 83° 28' 35" W, 400–744 m, 30 Aug 1990, *Herrera & Fallas 4172* (MO); Cantón de Osa, Sierpe, San Juan, Cuenca superior del Río Dan Juan, estribaciones Cerros Chocuaco, 8° 43' 50" N, 83° 33' 05" W, 580 m, 29 Jan 1991, *Herrera 4894* (USF). **Limón.** Cordillera de Talamanca along ridge between Quebrada Camagre and Rio Barbilla, 10° 00' N, 83° 24.5' W, 180–480 m, 9 Sep 1988, *Grayum, Robles & Martínez 8918* (MO, USF); Cordillera de Talamanca, Cantón de Matina, Formation Caliza Río Barbilla, 10° 00' 30" N, 83° 25' W, 200–300 m, 18 Oct 1988, *Herrera 2208* (MO).

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